



# Leveraging NBS R1.1.3 Functionality & NBS Demonstration

2004 PHIN Conference

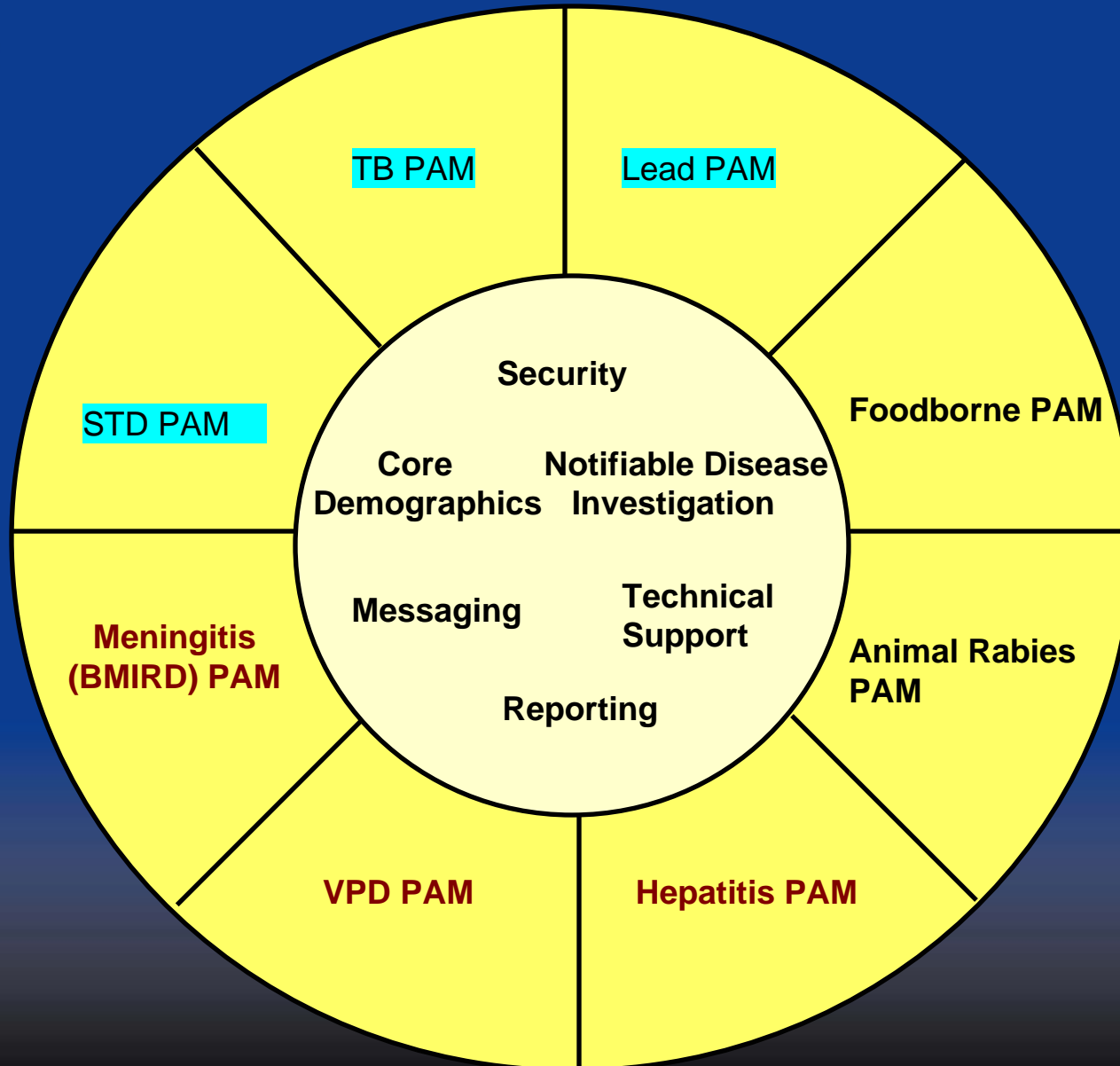
Jim Kauflin, NBS System Architect

Linda Mattocks, MPH, NBS Business Architect

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# NBS Functions



Future Releases

Current Release

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# NBS R1.1.3 Conditions

African Tick Bite Fever  
Amebiasis  
Amnesic shellfish poisoning  
Anisakiasis  
Aseptic meningitis  
Babesiosis  
Bacterial meningitis, other  
Botulism, foodborne  
Botulism, infant  
Botulism, other (includes wound)  
Botulism, other/unspecified  
Botulism, wound  
Brucellosis  
Campylobacteriosis  
Cat scratch fever (Bartonellosis)  
Cholera  
Ciguatera fish poisoning  
Coccidioidomycosis  
Colorado tick fever  
Cryptosporidiosis  
Cyclosporiasis  
Dengue Fever  
Dengue hemorrhagic fever  
Diarrheal disease, not otherwise specified  
Diphtheria  
Diphyllobothrium latum  
Ehrlichiosis, Human granulocytic  
Ehrlichiosis, Human monocytic  
Ehrlichiosis, Human, Other&unspec  
Encephalitis, Cache Valley  
Encephalitis, Eastern equine  
Encephalitis, post-chickenpox  
Encephalitis, post-mumps  
Encephalitis, Powassan  
Encephalitis, St. Louis  
Encephalitis, Venezuelan equine  
Encephalitis, West Nile  
Encephalitis, Western equine

Encephalitis/meningitis, Calif serogroup viral  
Enterohem. E.coli O157:H7  
Enterohemorrhagic E.coli, shiga + serogp non-o157  
Enterohemorrhagic E.coli, shiga + (not serogpd)  
Flu activity code (Influenza)  
Foodborne Illness, NOS  
Giardiasis  
Group A Streptococcus, invasive  
Group B Streptococcus, invasive  
Haemophilus influenzae, invasive  
Hansen disease (Leprosy)  
Hantavirus infection  
Hantavirus pulmonary syndrome  
Hemolytic uremic synd.postdiarrheal  
Hepatitis  
Hepatitis A, acute  
Hepatitis B Viral Infection, Perinatal  
Hepatitis B virus infection, Chronic  
Hepatitis B, acute  
Hepatitis C Virus Infection, chronic or resolved  
Hepatitis C, acute  
Hepatitis Delta co- or super-infection, acute  
Hepatitis E, acute  
Hepatitis Non-ABC, Acute  
HTLV-I infection  
HTLV-II infection  
Influenza, animal isolates  
Influenza, human isolates  
Kawasaki disease  
Legionellosis  
Leptospirosis  
Listeriosis  
Lyme disease  
Lymphogranuloma venereum  
Malaria  
Measles (Rubeola)  
Mucopurulent cervicitis (MPC)  
Mumps

Neisseria meningitidis, invasive  
Noroviruses  
Other injury  
Paralytic shellfish poisoning  
Pertussis  
Plague  
Poliomyelitis, Paralytic  
Psittacosis (Ornithosis)  
Q fever  
Rabies, animal  
Rabies, human  
Reye syndrome  
Rheumatic fever  
Rocky Mountain spotted fever  
Rotavirus  
Rubella  
Rubella, Congenital Syndrome (CRS)  
S. aureus, coag+, meth- or oxi- resistant (MRSA)  
S. aureus, coag-pos, vancomycin-resistant (VRSA)  
S. aureus, vancomycin intermediate susc (VISA)  
Salmonellosis  
Scarlet fever  
Scombroid fish poisoning  
Shigellosis  
Smallpox  
Staphylococcal enterotoxin  
Strep pneumoniae, drug resistant, invasive  
Strep pneumoniae, invasive  
Strep, other, invasive, beta-hem (non-A nonB)  
Streptococcal toxic-shock syndrome  
Sudden infant death syndrome  
Tetanus  
Toxic-shock syndrome, staphylococcal  
Toxoplasmosis  
Trichinosis (Trichinellosis)  
Tularemia  
Typhoid fever (Salmonella typhi)  
Typhus fever, (epidemic louseborne R. prowazekii)

Typhus fever-fleaborne, murine  
Vancomycin-Resistant Enterococcus  
Varicella (Chickenpox)  
Verotoxigenic E. coli  
Vibrio parahaemolyticus  
Vibrio spp., non-toxigenic, other or unspecified  
Vibrio vulnificus infection  
West Nile Fever  
Yellow fever  
Yersiniosis

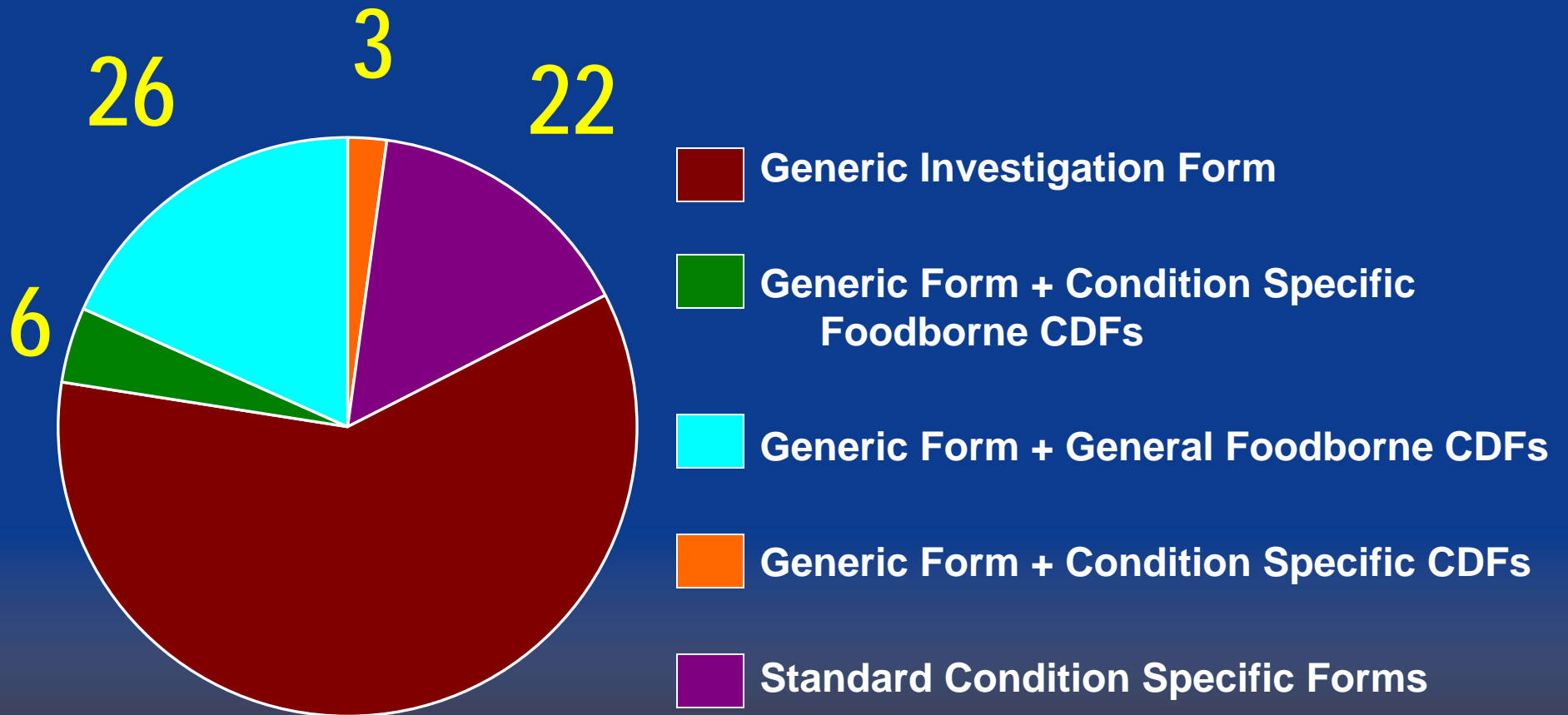
## Limited Functionality until future PAM

Chancroid  
Chlamydia trachomatis genital infection  
Gonorrhea  
Granuloma inguinale (GI)  
Neurosyphilis  
Nongonococcal urethritis (NGU)  
Pelvic Inflammatory Disease, Unknown Etiology  
Syphilis, early latent  
Syphilis, late latent  
Syphilis, late, not neurosyphilis  
Syphilis, primary  
Syphilis, secondary  
Syphilis, unknown latent  
Syphilitic stillbirth  
HIV Infection, adult  
HIV Infection, pediatric  
AIDS  
Tuberculosis  
Lead Poisoning

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# NBS R1.1.3 Conditions & Investigation Form Categories



**85**  
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# NBS Generic Investigation Form



- Leverages a standard set of surveillance questions
- 85 conditions are configured to use the generic form
- Local & State reportable conditions can be added to NBS and linked to the generic investigation

## NBS Generic Investigation Form

Header

Button Bar



Patient

Condition X

### Investigation Sections

- ◆ Investigation Summary
- ◆ Reporting Source
- ◆ Clinical
- ◆ Epidemiological
- ◆ Admin

LDF/CDF/Custom Subform Sections

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## Generic Form + Condition Specific Foodborne CDFs



A unique set of Foodborne questions per condition were added to the NBS Generic Investigation Form

- Botulism
- Cholera
- Cryptosporidiosis
- Cyclospora
- Listeria
- Salmonella

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## Generic Form + General Foodborne CDFs

The same 113 General Foodborne questions were added to NBS Generic Investigation Page

- Shigellosis
- Amebiasis
- Vibrio spp., non-toxigenic, other or unspecified
- Vibrio parahaemolyticus
- Vibrio vulnificus infection
- Enterohem. E.coli O157:H7
- Enterohemorrhagic E.coli, shiga + serogp non-o157
- Enterohemorrhagic E.coli, shiga + (not serogpd)
- Yersiniosis
- Giardiasis
- Toxoplasmosis
- Ciguatera fish poisoning
- Diarrheal disease, not otherwise specified

- Norovirus
- Paralytic shellfish poisoning
- Scombroid fish poisoning
- Rotovirus
- Campylobacteriosis
- Staphylococcal enterotoxin
- Verotoxigenic E. coli
- Anisakiasis
- Typhoid fever (Salmonella typhi)
- Trichinosis (Trichinellosis)
- Diphyllbothrium latum
- Amnesic shellfish poisoning
- Foodborne illness, not otherwise specified

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## Generic Form + Condition Specific CDFs



A unique set of questions per condition were added to the NBS Generic Investigation Form

### **VPD Conditions**

- Mumps
- Tetanus

### **Additional Conditions**

- Animal Rabies

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# Standard Condition Specific Investigation Forms



## Vaccine Preventable Disease (VPD)

- Measles (Rubeola)
- Pertussis
- Rubella
- Rubella, Congenital Syndrome (CRS)

## Hepatitis

- Hepatitis A, acute
- Hepatitis B, acute
- Hepatitis B Viral Infection, Perinatal
- Hepatitis C, acute
- Hepatitis C Virus Infection, chronic or resolved
- Hepatitis Delta co- or super-infection, acute
- Hepatitis E, acute
- Hepatitis B virus infection, Chronic
- Hepatitis Non-ABC, Acute

## BMIRD

- Streptococcal toxic-shock syndrome
- Group A Streptococcus, invasive
- Group B Streptococcus, invasive
- Bacterial meningitis, other
- Strep, other, invasive, beta-hem (non-A nonB)
- Haemophilus influenzae, invasive
- Neisseria meningitidis, invasive (Mening. disease)
- Strep pneumoniae, invasive
- Strep pneumoniae, drug resistant, invasive

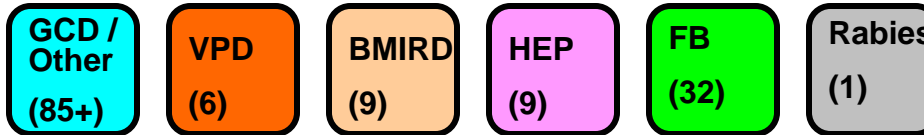
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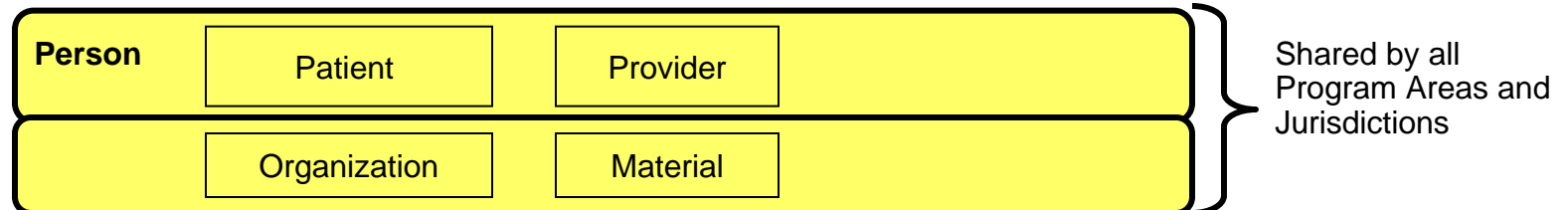
# NBS R1.1.3 Product Summary



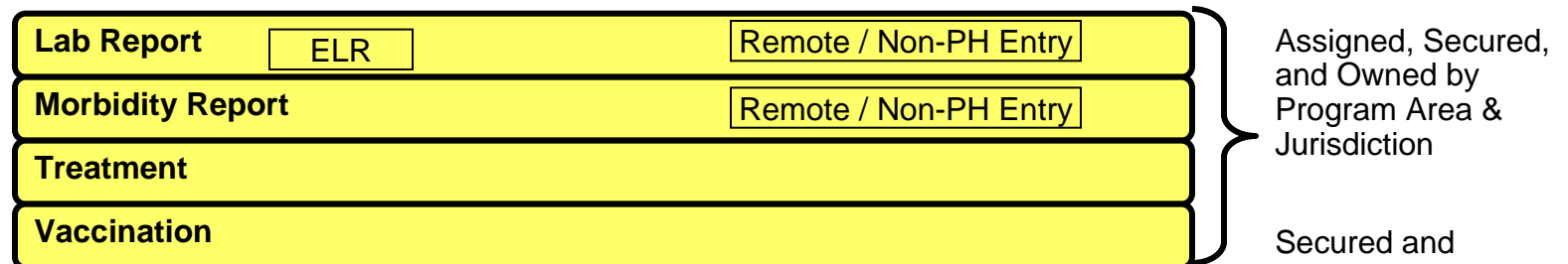
## Programs (Reportable Conditions)



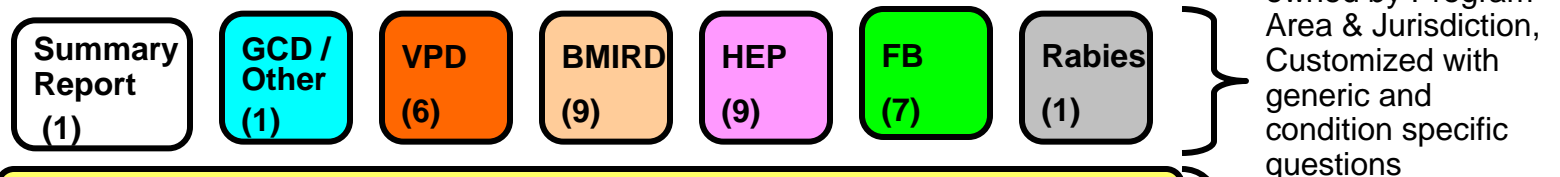
## Entities



## Events



## Investigations (NBS Forms)



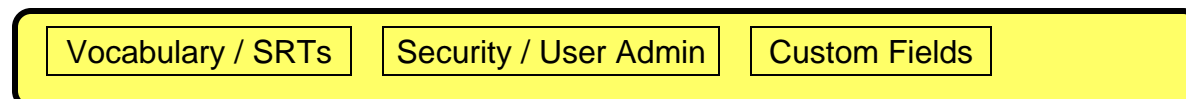
## Case Notification Messages



## Analysis & Reporting



## System Admin





# NBS Functionality: Support for Public Health Functions

- Seamless and timely receipt of Public Health Reports
- Workflow management: Assignment of Public Health Reports for Follow-up
- On-line case management: Investigation details and supporting information
- Quality control and review process for all new cases and real-time notification to CDC
- Analysis, Visualization and Reporting

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# NBS Functionality: Support for Public Health Functions

- Seamless and timely receipt of Public Health Reports
  - ◆ Electronic reporting
  - ◆ Remote entry of morbidity report or lab report
  - ◆ Manual entry of paper lab or morbidity reports

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# NBS Functionality: Support for Public Health Functions

- Workflow Management: Assignment of Public Health Reports for Follow-up
  - ◆ Create Initial Investigation
  - ◆ Assign an Investigator

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# NBS Functionality: Support for Public Health Functions



- On-line case management:  
Investigation details and supporting information
  - ◆ Update Investigation Details
  - ◆ Associate lab reports, morbidity reports, treatment records and vaccination records

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# NBS Functionality: Support for Public Health Functions



- Quality control and review process for all new cases and real-time notification to CDC
  - ◆ Update case status
  - ◆ Create an NND notification
  - ◆ Approve an NND notification

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# NBS Functionality: Support for Public Health Functions

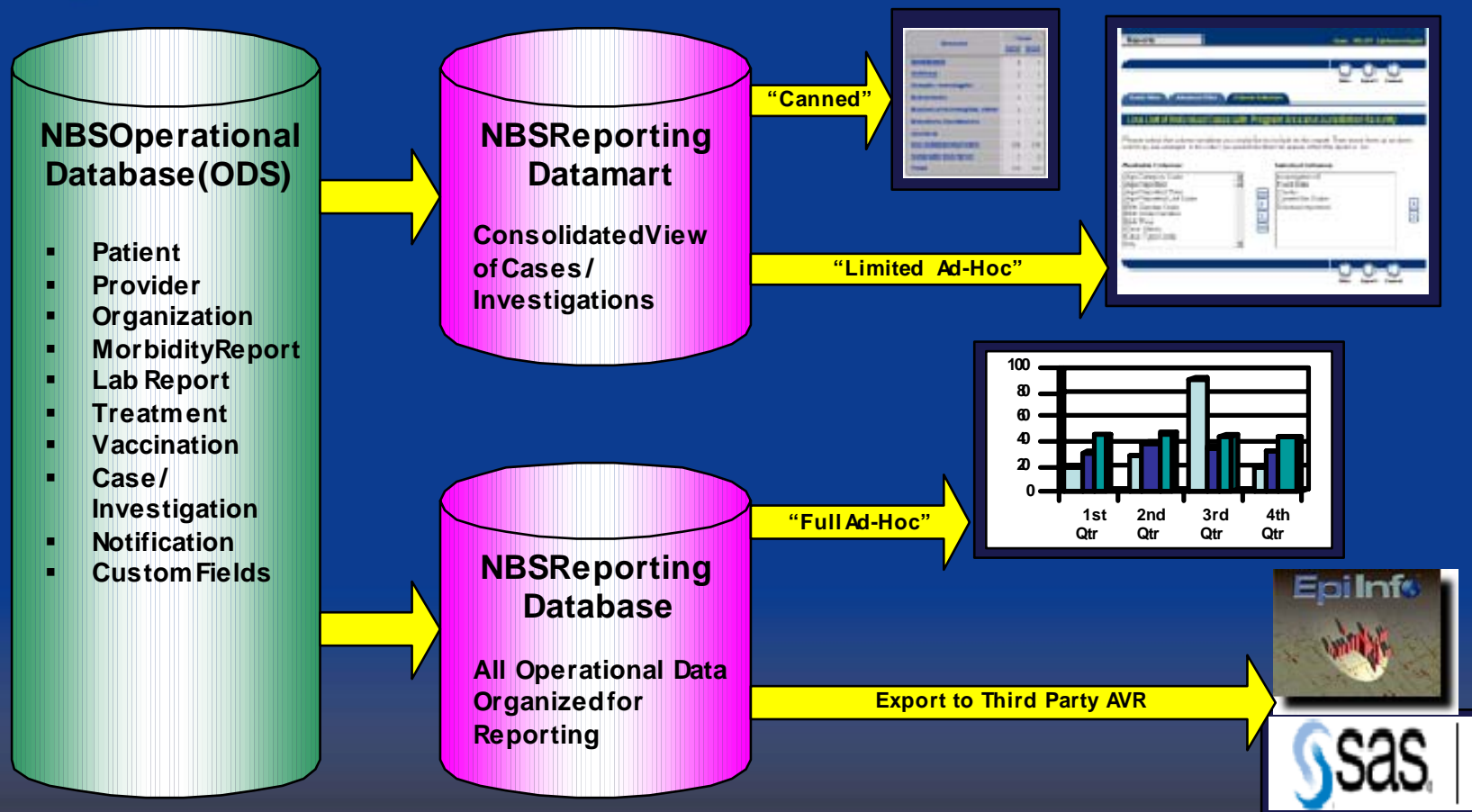
- Analysis, Visualization and Reporting
  - ◆ NBS Reporting module
    - ★ Morbidity Trends
  - ◆ NBS Reporting database
    - ★ Morbidity Trends
    - ★ Quality Assurance
    - ★ Program Management and Evaluation

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# NBS Functionality: Reporting



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# NBS Functionality: Reporting

## Gender Distribution for Hepatitis C Acute & Hepatitis C virus infection by Race

	GENDER			TOTAL #	GENDER		
	F	M	U		F	M	U
	#	#	#		%	%	%
<b>RACE</b>							
African American	3	5	.	8	0.12	0.20	.
American Indian	1	3	.	4	0.04	0.12	.
American Indian or Alaska Native	2	2	.	4	0.08	0.08	.
Asian	1	.	.	1	0.04	.	.
Asian Indian	.	1	.	1	.	0.04	.
Black or African American	1	3	.	4	0.04	0.12	.
European	7	15	.	22	0.28	0.59	.
Unknown	844	1605	13	2462	33.37	63.46	0.51
Vietnamese	.	1	.	1	.	0.04	.
White	10	12	.	22	0.40	0.47	.
<b>TOTAL</b>	869	1647	13	2529	34.36	65.12	0.51



# NBS Supporting Functionality

- Person Centric System
  - ◆ Patient Registry
  - ◆ Patient demographic information also associated with each event
  - ◆ Patient Search
  - ◆ Patient Summary
  - ◆ Deduplication

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# NBS Supporting Functionality

- Automatic Deduplication Match Criteria:
  - ◆ Required for match
    - ★ Name
    - ★ Date of birth
    - ★ Gender
    - ★ Race
    - ★ Ethnicity
  - ◆ Other demographic variables are included if present but not required for match to occur

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# NBS Supporting Functionality

- Provider and Organization Registry
  - ◆ Search
  - ◆ Associate to an Event
  - ◆ Entity Data Migration

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# NBS Supporting Functionality

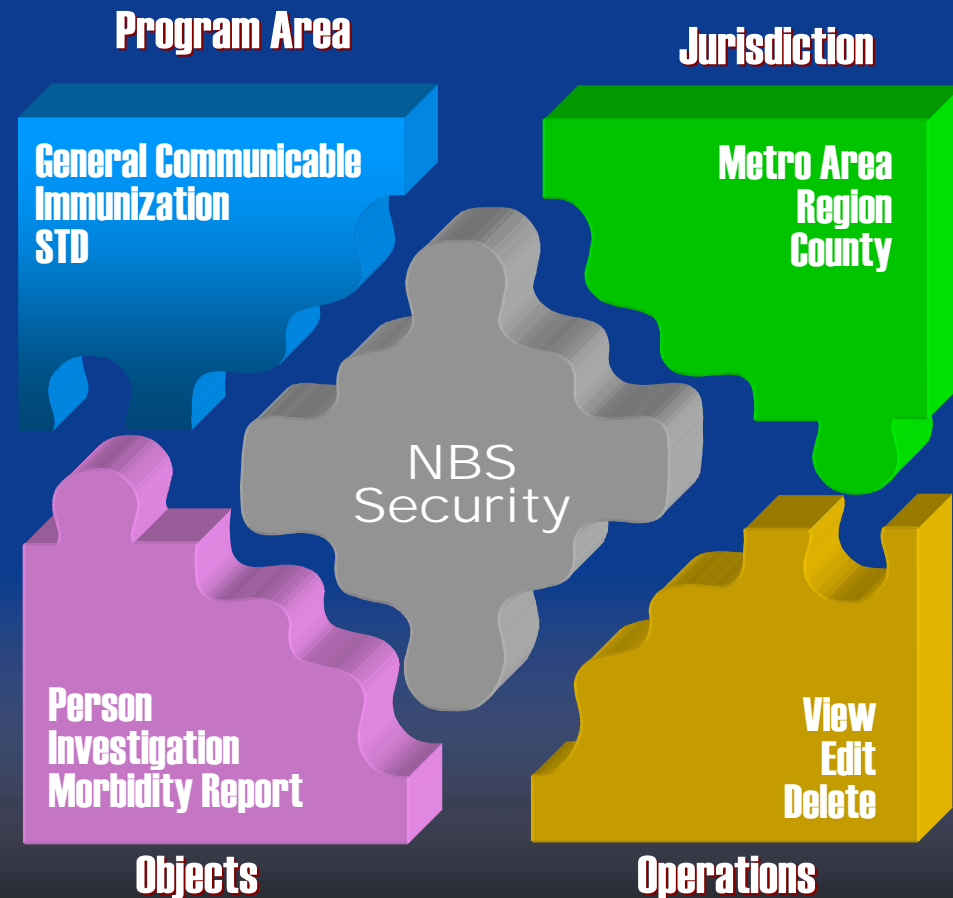
- System Administration
  - ◆ Security
    - ★ Master System Administrator
    - ★ Program Area Administrator
  - ◆ User permissions
  - ◆ Monitor ELR activity

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# NBS Supporting Functionality

**Security:** A user role is composed of 4 controls. These define the data and functions a user can access.



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# NBS Supporting Functionality

- System Extensibility
  - ◆ Custom Fields
    - ★ Locally Defined Fields (LDFs)
    - ★ Collaboratively Defined Fields (CDFs)
    - ★ Custom Subforms
  - ◆ Standard Reference Tables
    - ★ Program Area
    - ★ Jurisdiction
    - ★ State specific conditions
    - ★ Lab Test local mapping tables
    - ★ State Defined Code Sets

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# NBS System Services

- Export information about custom fields to populate the National LDF/CDF Metadata Repository
- Generate and transmit case notification messages to CDC
- Import ELR (electronic laboratory reports) records and derive program area and jurisdiction
- Create the public health data mart table that supports the NBS reporting module
- Create the Reporting Database through the Master ETL (extraction, translation and load) process
- Deduplicate the patient registry by running an automatic exact-match merge and by generating a list of potential duplicate patients for manual review

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# Fully Leveraging NBS

Category	Fully Leveraged
Program Areas/Conditions	All national, state and local notifiable conditions are collected and assigned to a program area
Jurisdictions	All health jurisdictions use the NBS
Users	1. All public health workers use the NBS to support activities and are provided appropriate NBS user rights 2. All providers and labs not able to send ELR report potential cases using NBS remote entry features
Data Migration	Entity Migration from external sources Event Migration from historical legacy systems

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# Fully Leveraging NBS

Category	Fully Leveraged
ELR Sources & Conditions	All possible Labs are reporting all conditions using ELR feature. Includes opportunity to use ELR capability as a pass through to the other systems.
Analysis, Visualization, and Reporting	Select prepared reports and customizable line list reports are packaged with NBS. The NBS Reporting Database provides all information in an industry standard format to facilitate ad hoc analysis.
Extensibility	Custom Fields can be added to patient, lab report, morb report, treatment, vaccination, organization, and provider and to investigations either all or limited by condition or condition groups.

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## NBS Future Direction

- Additional Program Area Modules (PAMs)
- Interstate Notification
- Clinical Data Exchange
- Automatic Case Determination
- Contact Tracing / Epi Networks
- Seamless integration with other PHIN Products
  - ◆ OMS, BioSense, PHIN VS, etc....
- ELR certification of additional National Labs
  - ◆ Quest & Mayo Clinic

Session 7.B NBS R1.1.3 & Future Plans : Wed 10:30am – 12:00pm

Session 8.B Future NEDSS PAMs : Wed 1:30pm – 2:30pm

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## NBS: a Powerful Tool

- Replaces NETSS and provides additional robust surveillance and investigation functionality
- Uses a simple point and click web browser interface to facilitate ease of use for all public health professionals and other health care partners
- Notifies CDC about cases and provides anytime/anywhere secured access to manage public health episodes
- Offers enhanced analysis opportunities through the reporting database and through CDC distributed SAS licenses and through EpiInfo

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## NBS: a Powerful Tool

- Eliminates the need to process paper public health reports through seamless integration of laboratory results received electronically and online reporting of laboratory results and clinical diagnoses by authorized health care providers
- Provides real time access to surveillance data for all levels of public health
- Secures system access using administrative capabilities that are configured by each state/major jurisdiction and are based on condition, localities, and specific system functions
- Integrates into the state/major jurisdiction information system security infrastructure

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# Opportunities For Improving Public Health Processes



- Refine public health surveillance processes by minimizing duplicated efforts and streamlining activities at all levels of public health
- More effective allocation of resources for quicker investigation, analysis, and intervention
- Integration of routine surveillance for preparedness by providing tools to support investigation, analysis, and intervention
- More rigorous analysis based on better quality and more timely reporting

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# Opportunities For Improving Public Health Processes



- Requires little infrastructure for local health departments and private providers to participate
- Redefine roles as focus shifts from data entry to data monitoring, allowing earlier identification of health issues
- Standardization of surveillance data based on questions being collaboratively defined by a consortium of public health partners

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# Questions & Comments

- 2<sup>nd</sup> NBS Demonstration Session
  - ◆ Wednesday 5:30pm - 7:00pm
- Scheduled NBS demonstrations at the PHIN Booth
  - ◆ Tuesday: 4:00pm – 6:00pm
  - ◆ Wednesday: 8:00am – 10:00am
- Contact the NBS Deployment Coordinator to schedule an NBS Demonstration

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